

CREATIVE HANDS
and
PURPOSEFUL ACTIVITIES
in the
ELEMENTARY SCHOOL

An Industrial Arts Bulletin

BULLETIN 333

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FOREWORD

As we progress to the rapidly approaching time when we shall organize elementary school curriculums on the basis of important life activities, industrial arts work will furnish one of the largest unifying and integrating forces. This bulletin has been written to help teachers, supervisors, and administrators to understand better the importance and function of industrial arts experiences and to suggest how these experiences may interpenetrate and enrich the lives of boys and girls.

Two points of view have been basic to the development of this bulletin:

- (1) That industrial arts is fundamentally a social study.
- (2) That each child should be given an opportunity to discover and develop his own peculiar potentialities in varied creative experiences.

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Creative Hands and Purposeful Activities in the Elementary School

I. INTRODUCTION¹

A. CHANGING CONCEPTIONS OF THE MEANING OF INDUSTRIAL ARTS

Following the Centennial Exposition in Philadelphia in 1876, American educators were for a time influenced by an exhibit of a formal and abstract system of manual training. Here the fundamental tool processes were taught apart from any particular job. Mental discipline was basic and hand training in abstract exercises was emphasized. Manual-training high schools organized on the Russian lines were opened in St. Louis, Chicago, Toledo, and Baltimore. By 1894, emphasis was shifted to the making of practical articles. The Swedish sloyd system had influenced this change. This was the arts-and-crafts stage. It emphasized the beauty and artistic design of articles made.

The shift from manual training and manual arts to the industrial arts stressed the relation of shop courses to the industrial world. Among the aims in industrial arts education in the elementary school and the junior high school were skill in tool processes and prevocational education.

Today industrial arts education is more or less clearly distinguished from vocational education. The major purpose of an industrial-arts course is general education, which will help young people more intelligently to understand modern industry. The major purpose of vocational education is a high degree of skill and technical efficiency in a specific trade or occupation. The scope of elementary industrial arts has widened from the mere construction of things to include a study of industrial products. For the kindergarten and first six grades of the schools, the values from the studies of the industries should include those that are common to all children, both boys and girls, without reference to prospective occupations. These values should be those which contribute to efficiency in the activities of the consumer and citizen. They call for a study of the changes man makes in raw materials to increase their value for usage, the study of selection in relationship to purposes of usage, a study of the care and upkeep of products possessed, and a study of the social responsibilities we should share as a result of the methods and practices of industrial production and distribution.

¹ This discussion is based upon materials found in the following references: Bonser, F. G. *Industrial Arts for Public School Administrators*, 1930; and *Life Needs and Education*, 1932. Bureau of Publications, Teachers College, Columbia University.

Bonser, F. G., and Mossman, L. C. *Industrial Arts in the Elementary School*. Macmillan, 1928.

Norton, J. K., and Norton, M. A. *Foundations for Curriculum Building*. Ginn, 1936. Chapter XV.

In practical life, the industrial arts are the occupations or activities by which man changes or transforms the raw materials of nature to increase their values for human usage. In a broad sense, the term "manufacture" has the same meaning; but industrial arts is preferable because it is more inclusive. The school study called "industrial arts" grows out of the problems which we meet in supplying our material needs.

B. OUR DEFINITION

In our definition of the industrial arts as a vital part of the elementary school curriculum, we accept that given by the late Frederick G. Bonser,² as "... a study of the changes man makes in materials to increase their values to meet needs, of the appropriate usage of products made, and of the social advantages and problems resulting from these changes and products."

If one would ask where art as beauty enters into industrial arts as a study he has but to study the whole of "My Art Creed"³ by Bonser. We quote in part: "That the materials of industry—paper and woods and metals and clay and fibers—must be regarded as but media for the expression of life problems with beauty of form and color as an inseparable element in its resolution."

C. PURPOSES OF INDUSTRIAL ARTS STUDY

1. SOCIAL VALUES

The definition of industrial arts as a study suggests certain values which contribute to the effective solution of problems of living on the part of the consumer, the citizen, and the intelligent man or woman. As consumers of products, we select and use the products of industry intelligently to the extent that we know their qualities and values in relation to their purposes. These qualities include the appropriateness of materials to their purposes, the wearing quality of materials and construction, beauty, economy, and how to use and care for the materials. Such qualities can be learned best by a study of the materials and changes made in them to increase their qualities. This is an appropriate study on the elementary school level. Ruth Brindze in her book, *Johnny Get Your Money's Worth (and Jane, too!)*, published by the Vanguard Press, New York, 1938, shows how boys and girls in the elementary school are potential consumers even at this age and suggests how they may be helped to become aware of it. As citizens, such studies help us to understand the sources of materials, how they are produced and how distributed, so that we can contribute more intelligently to movements which result in fair treatment to both producers and consumers. As intelligent men and women, these studies help us to gain an appreciation of how man has made the resources of the world contribute to better living. Such understandings develop gradually and may have their beginnings in the experiences of the elementary school.

² Bonser, F. G. *Industrial Arts for Public School Administrators*. Op. cit. p. 2.

³ Bonser, F. G. *Life Needs and Education*. Op. cit. pp. XV and XVI.

A consideration of values of products to meet needs includes values relating to health, to economy, to efficiency, and to esthetic satisfaction. The study of sources of materials, how they are changed, factory organization, inventions, employer and labor relationships, marketing and distribution of products, and means to secure justice alike to producers and consumers breed values in social understanding. The creative and manipulative activities essential to the development of appropriate knowledge and feelings include that work in design, construction, decoration, and experimentation which promotes growth in coordination of hand and eye, general manipulative dexterity, freedom in handling tools and materials, esthetic appreciation of products, and mental health resulting from the opportunity to express one's inner self in satisfying and socially useful ways.

This leads to a formulation of five specific objectives for the industrial arts as a social science.

- (a) *The health purpose* as related to our study of food, industries, clothing, and problems of heating, lighting, ventilation, and the disposal of waste. The study of industrial arts provides us with much information which gives reason and reinforcement for the formulation of health habits.
- (b) *The economic purpose* is related to our study of the usefulness, the durability, and the money value of articles which man has made for his purposes. We learn of the materials used to make these products and of the processes by which they are made to serve specific purposes. When we know the kinds of materials entering into certain kinds of fabrics, and how these mixtures differ in durability and permanence of surface appearance, and when we know how to test and recognize the materials in fabrics we shall be better able to purchase them with real economy. When we know the real nutritive value of foods and how these may be properly cooked or prepared for use, we shall be able to live at a relatively smaller cost without sacrifice of health or taste.
- (c) *The art or esthetic purpose* has to do with a study of industrial products from the point of view of being satisfying in their art elements. That there be a going-togetherness of utility and beauty in materials is the goal. Everyone has some capacity for appreciation of fine design and it can be cultivated to make possible a considerable degree of satisfaction in judging of qualities of beauty in clothing, household furnishings, utensils, food products, and other products.
- (d) *The human-relationship purpose* is related to a study of conditions under which products are made and distributed. The human element here is paramount. An acquaintance with the problems and relationships of people helps us to be intelligent and sympathetic in the regulation of the conditions of production and selling so that employers, employes, and consumers

shall all be treated with fairness in the production and use of products.

- (e) *The recreational purpose* grows out of the strong curiosity of boys and girls to find out what things are made of, how they are made, and what they are used for. The study of industrial arts helps to direct this form of curiosity and, at the same time, provides growth in intelligence about the means by which man supplies himself with products to meet his needs. A lifelong interest may be developed in the activities of industry so that one will find satisfaction throughout the years in noting its changes and progress.

2. CREATIVE VALUES

It has been indicated that a provision for creative experiences has a rightful place in the study of industrial arts as a social science. That children can be creative with clay, wood, tin, yarn, leather, and other media commonly associated with the study of industrial arts, as well as with paints and canvas, is plainly obvious. Yet the tendency sometimes is to place these activities upon a "pattern copying" plane almost exclusively. This grows out of a lack of faith in the child's ability to create and express his own ideas because his product does not conform to the set standards of an adult. Teachers are becoming more and more aware that ideas and effective ways of expressing them grow to the extent that a child experiences the freedom and receives the guidance necessary for satisfying creativity. Every child is endowed with the impulse to create and to express his feelings in material form—a desire to express ideas and feelings in drawing, painting, modeling, and in designing, constructing, and decorating objects. It is essential to the health and well-being of the child that this outlet for his creative impulses be provided in his early years. The essential thing is not so much what the child creates as what the creative experience does to the child.

Sometimes mere construction may be the first interest of the child, and this might have values in itself. If mental hospitals prescribe constructive activities for the purpose of securing mental stability, might mere construction not have values in maintaining mental and emotional balance? If the work of mere construction can be made the basis of thinking and appreciating, it obviously can be of greater educative value.

3. PURPOSES SUMMARIZED

The purposes of industrial arts as a study are thus seen to be practical in meeting immediate needs in the selection and use of industrial products and in an understanding of human relationships involved in production and distribution. It also leads to a development of many abilities—intellectual, appreciative, and creative. In addition to these achievements of growth, it can give significance and value to other subjects of the curriculum. Lastly, industrial arts activities provide an outlet for creative expression.

D. PLACE OF INDUSTRIAL ARTS IN THE CURRICULUM

In schools, the industrial arts should have a place in keeping with their importance outside of school, and we know that a large part of the world's work consists of the making and distributing of the many commodities we use in our daily lives. Its value, as will be indicated later, in all areas of human experiencing, makes it significant. It permeates the whole curriculum, giving meaning and significance to the materials of all other subjects. It is entitled to a large place in the curriculum because it affords opportunities to construct, to investigate, to experiment, to create, and to learn through those activities in which the elementary school child can engage with success. It meets the needs of that more than half of our school population who can think best in terms of concrete experiences.



CONCEPTS OF A DEVELOPING WORLD ARE EXPRESSED AND CLARIFIED THROUGH A STUDY OF THE INDUSTRIES

E. OUTCOMES IN TERMS OF CHILD DEVELOPMENT

The industrial arts should occupy an integral part of the common education for boys and girls in the elementary school, and should provide the child with such activities and experiences as will help him:

1. To acquire a background and judgments for evaluating products of industry.
2. To learn how to conserve health, time, money, and materials.
3. To have experiences of taste and judgment that will lead to a recognition of and desire for fine quality and the best in everything.

4. To realize the interdependence of peoples and the resultant necessity for cooperation.
5. To develop the best in social attitudes and behavior.
6. To understand some of the relationships that exist between the past and the present.
7. To develop habits of investigation, experimentation, and creation.
8. To plan purposefully and to consider the appropriate means to the desired end.
9. To develop dexterity and skills through the manipulation of tools and materials commensurate with his ability.
10. To use the knowledge and skills gained as a means to making leisure time a happy and profitable "playtime."

II. INDUSTRIAL ARTS IN RELATION TO THE CURRICULUM

A. THE CONTENT OF INDUSTRIAL ARTS

For the kindergarten and first six grades, industrial arts content grows out of the problems and needs of consumers and citizens in six inclusive fields from which we supply ourselves with material commodities. These fields are those by which we provide ourselves with: (1) food; (2) clothing; (3) shelter and home furnishings; (4) utensils; (5) tools and machines; and (6) records, or books and publications. There is some material in each of these fields from which children at any level of development can learn with profit and satisfaction, and for which their natural impulses—manipulation, investigation, creation—afford the drives. Space is not available here for a detailed development of the activities which grow out of such an organization. A more exhaustive development can be found in *Industrial Arts for Elementary Schools*, by F. G. Bonser and L. C. Mossman, published by the Macmillan Company; in *Social and Industrial Studies for the Elementary Grades*, by J. B. Welling and C. W. Calkins, published by J. B. Lippincott Company, and in the *Course of Study in Industrial Arts, Grades I-IV*, published by the Board of Education, Philadelphia, Pennsylvania. However, a suggestive outline relative to each of the six fields and formulated from these sources, in part, is appropriate here to indicate the points of selection and emphasis with reference to the distribution of the work on the primary and intermediate levels of the elementary school. See Chart 1.

B. RELATIONSHIP OF INDUSTRIAL ARTS TO PROBLEMS OF LIVING

Certain persistent problems of living may be made the basis for a dynamic core-curriculum for elementary schools. These include such problems as: How to keep well, how to earn a living, how to get along with other people, how to adjust to and improve one's environment, how to enjoy art and beauty, and how to develop a philosophy or a sustaining set of values. These problems lead into certain areas of human experience which have been selected to give direction for a social studies program for Pennsylvania.¹ The areas of experience define a direction for the entire school curriculum. The purpose here is to show how the content of industrial arts may feed into or grow out of these areas of human experience in the primary and intermediate levels of the elementary school. Lack of space and a lack of knowledge of specific conditions make it impossible to present an exhaustive listing of possibilities fitted specifically to meet each child's needs. The teacher, who knows well the needs of each child and who can see learning opportunities inherent in his environment, can best choose and direct those industrial arts experiences which will lead to the fullest educational growth. It is hoped that the few examples of likely emphases given here will suggest to her the

¹ *A Tentative Chart Showing the Scope and Sequence of a Social Studies Program*. Department of Public Instruction. Harrisburg, Pennsylvania. 1938.

CHART 1

CONTENT OF INDUSTRIAL ARTS

Materials Necessary to Living

1. Food

In connection with the study of the home, children may cook and bake: canning fruit, making jelly, making cookies and cocoa for a party, cooking vegetables for lunch period, etc. They may plan menus for picnics. They may also wash dishes and select those appropriate for certain purposes.

They may visit the farm and grocery store as sources of supply to the home. They may make a study of milk and its products. They may make booklets to keep their own health records. They may find out about the food of primitive peoples: Indians, Eskimos, etc.

2. Shelter

A study of family life includes attention to the house and its furnishings. Activities may include making a doll- or playhouse, painting and papering it, making the furniture and furnishings. There will be discussion about the size and shape of the house and of what material it is to be made; of the things in the home, where they come from, and what use is made of them; of its location relative to the view, sunlight, air, available water, and drainage; of

Grades IV, V, VI

Tracing foods to their sources. Attend market to see foods brought in. Find how the foods are prepared for marketing: raisins, dates, figs, macaroni, eggs, cereals, sugar, salt, flour, canned fruit, ice cream, meats.

Visiting a meat market. Finding content of different foods: carbohydrates, protein, fats, vitamins, water, minerals.

Preparing or cooking foods: cereals, dried fruits, ways of preparing eggs, white sauce, vegetables, bread, canned fruit, ice cream, soup, pot roast.

Finding what the colonists used for food: making maple sugar, etc. Making soap.

Finding what food was used by people who lived in castles. Discussing ways of washing dishes. Learning to plan a meal; to know 100-calorie portions; to buy economically.

As the child explores and adventures in an expanding environment he may become acquainted with a variety of homes: a Mexican abode, an Italian villa, a Japanese pergola, a Philippine bamboo house, a Kansas prairie sod house, a miner's cabin, a New York City apartment house, a California bungalow, a Mississippi house boat, a log cabin, a New England farmhouse, etc. Materials used in building may be traced to their source, the method of production

2. Shelter

the way it is heated, lighted, and ventilated; of the furniture in the house, where it was bought, the materials of which it is made, how it is cared for, and of what use each piece is; of how the house is cleaned, aired, and kept in condition.

Comparing our homes with the dwelling places of primitive man. Making Indian homes, an Eskimo snowhouse, a Hebrew tent.

Making a booklet of pictures of different types of houses.

Visit lumber and brick yards, stone quarries, a cabinet maker.

Watch the construction of a real house or building.

found out, and the lives of people who live in them may be noted. Models of some of these homes might be reproduced.

Study of colonial life might include: making candles and candlesticks; making samplers, quilts, and rag rugs.

Greek and Roman houses and castles may be compared with homes of today.

Study of lumber industry.

Study of church building.

Making furniture for the home: bookcases, magazine racks, waste paper baskets. Recognizing characteristics of good furniture and different periods.

Studying rug values.

Considering harmony of house furnishings and decorations.

Caring for dolls: making clothes and dressing them; laundering the clothes.

Making collections of cloth samples: cotton, woolen, and silk pieces.

Finding where clothes come from: study of cotton, wool, and silk and how they are made into cloth.

Repairing and caring for own clothes.

Knitting, drying a skin, weaving; studying designs used in weaving.

Testing cotton, wool, silk, rayon, and linen materials; learning to distinguish animal from vegetable fibers; learning how silk may be loaded.

Further study of processes involved in producing these fabrics.

Finding what leather is.

Finding how American colonists provided clothing for themselves: spinning and weaving; dyeing.

3. Clothing

Learning how Indians and Eskimos clothe themselves.

Study of Romans, Greeks, or other peoples relative to clothing.

Use of rubber in clothing.

Studying life of textile workers.

Studying designs in clothing.

How to select clothing and accessories.

Learning to use a sewing machine and to make garments: aprons, etc.

Learning how to cleanse and preserve clothing.

Acquaintance with costs and values in clothing.

Studying line and color relative to clothes.

16 4. Utensils

Making articles from clay for doll-, or play-house: dishes, flowerpots, vases. Firing them.

Visiting pottery, china store, clay bank.

Making Easter baskets and Christmas boxes.

Comparing boxes, baskets, and dishes.

Working with dishes: washing and drying them; placing in cupboard; setting table attractively.

Finding to what extent clay, china, and basket materials are used in the home.

Comparing pottery found in other parts of the world: Egyptian, Greek, Roman.

Finding how vases are made at potter's wheel.

Tracing development of pottery in different nations.

Finding kinds of pottery on sale in stores.

Making pottery map of the world.

Learning of noted pottery places in locality in state, in the country.

4. Utensils

Indian pottery: seeing a good collection; studying the designs; finding how Indians used it; making a bowl by the coil method; trying Indian method of firing.

Indian baskets: finding how they were made.
Learn of utensils used by Eskimos.
Listing things made of glass.

5. Records

Starting a classroom library and learning library methods.

Writing and making booklets and their designs.

Finding what paper is: making parchment; collecting different kinds of paper.

Finding how other people kept records: wampum belt, on stone, the quipu, clay tablets, on birch bark, on skins, the scroll.

Binding pamphlets. •

Making pottery and baskets; learning how to glaze pottery.

Learning what clay is and how clay beds are deposited.

Making handkerchief and glove boxes.

Making copper bowls.

Decorating vessels.

Learning how kilns are constructed.

Learning to choose good vases and dishes and their values.

Finding how the alphabet was made; about the beginnings of libraries; learning more about library methods; book binding.

Clarifying ideas about the paper industry: trip to a paper manufacturing plant; making paper from linen, from papyrus.

Finding what changes the invention of printing produced; learning about and using a printing press.

Finding how books are printed and illustrated: visiting a publishing establishment.

Making a sewed book.

Applying knowledge of book construction to the repair of books.

Writing and publishing a class or school magazine.

6. Tools and Machines

Kindergarten, Grades I, II, III

Noting tools used or referred to in the school work: knives, forks, spoons, the churn, the grinder, sieves, apple peelers, egg beaters, etc., in connection with foods; the scissors, needle, thimble, and ruler in connection with clothing work; the washboard, ironing board and iron used in the laundering of clothes; the broom, the mop, the carpet sweeper, and vacuum cleaner in house cleaning; the pencil, ruler, scissors, paste brush, and paint brush in making various articles; the saw, try square, and hammer in making the house and furnishings; a loom for weaving; simple musical instruments.

As each of these tools is taken up, its appropriateness may be considered; brief discussions may be had on its proper uses, how it is to be cared for, and the advantage that comes from its use.

In some instances children may make some tools.

They may gain some acquaintance with tools of primitive and pioneer peoples: stone implements, agricultural tools of wood, musical instruments.

Grades IV, V, VI

Considering machines used: in producing foods, in producing utensils and records, in making products of wood.

Finding changes in food production made by modern inventions: farm machinery.

Learning of inventions which contribute to shelter and furnishings: telephone, electric light, etc.

Considering machines used in making fabrics and garments: cotton gin, flying shuttle, spinning jenny, etc. Making a cotton gin.

Finding what machines are used in making records: printing press, linotype machine, phonograph, etc.

Investigating the evolution of vehicles.

Finding what machines are used in making utensils.

Making a paperweight by metal casting; electroplating it.

Investigating musical instruments.

Comparing cutting tools: butter knives, bread knives, butcher knives, etc.

Compare tools used in wood and metals.

Compare ancient vehicles with modern.

Noting the industrial and social changes resulting from inventions.

Finding how clocks and watches have developed.

possibilities in the content of industrial arts as it is needed for enriched living.

The two charts that follow on pages 20-29 contain suggestive emphases in the social studies and the industrial arts program in relation to nine areas of human experience. Chart 2 is for kindergarten and grades I, II, and III. Chart 3 is for grades IV, V, and VI. The left-hand column lists the areas of human experience; the middle column contains the suggested emphases found in Pennsylvania's social studies program; and the right-hand column shows some emphases in industrial arts for illustrative purposes. It is interesting to note to what great extent industrial arts is a social science study, indicated by the overlapping of emphases.

C. RELATIONSHIP TO UNITS OF EXPERIENCE

A unit of experience here refers to a more or less extended section of living with a variety of activities carried on by a part of, or the whole class, to gain certain satisfactions with reference to a larger problem or interest. For a discussion on the selection and development of units one may find many references. Two bulletins² published by the Department of Public Instruction offer some guidance.

Industrial arts as a study plays as large a part in the development in these units of experience as it does in living. For examples of the extent to which it has entered into some units we refer the reader to *Curriculum Making in an Elementary School*, by the Lincoln School Staff, Bureau of Publications, Teachers College, Columbia University.

Just what units of experience shall be developed in each classroom cannot be determined in advance. However, past experience has shown that the following units are worthwhile educationally and offer opportunities for industrial arts experiences:

1. The separate fields of industrial arts listed under A.
2. The home unit.
3. Transportation.
4. Communication.
5. Milk.
6. The farm.
7. Time.
8. The library.
9. Improving classrooms and school grounds.
10. Toys.
11. The Pennsylvania Germans.

² Bulletin 110—*Suggestions for the Development and Use of Curriculum Materials in the Elementary School*, 1936; Bulletin 418—*School Living for Social Purposes*, 1939. Department of Public Instruction. Harrisburg, Pennsylvania.

CHART 2

SUGGESTIVE EMPHASES IN THE SOCIAL STUDIES AND INDUSTRIAL ARTS PROGRAM IN RELATION TO AREAS OF HUMAN EXPERIENCE

For Kindergarten and Grades I, II, III

Center of Emphasis: The Immediate Environment—The Home, School, Community, Play

Areas of Human Experience	Suggested Emphases in the Social Studies Program	Emphases in Industrial Arts
Protecting and improving life, health, and property	<p>Community provisions for the protection of life and health: police, fire department, health clinic, hospital, sewage disposal, garbage disposal.</p> <p>Caring for plants and animals.</p> <p>Agencies in the community for the protection of plants and animals: game warden, fire warden.</p> <p>Learning about home, school, and community safety: school patrol, how to cross streets, playing in safety.</p> <p>Caring for personal health: teeth, eyes, nose, ears, mouth, diet, rest, exercise, clothing.</p> <p>Function of informal agencies for the protection of life and health: home and school.</p>	<p>Excursions to see community agencies.</p> <p>Building a model of the community in the classroom showing these separate provisions and their locations.</p> <p>Make pens for pets.</p> <p>Study of foods, and cooking and baking activities with emphasis upon selection of foods in relation to body needs.</p> <p>Sewing activities and study of clothing with emphasis upon health values.</p> <p>Building a home and study of shelter in relation to healthful living.</p>
Earning a living	<p>Production and exchange of goods in the community: store, market, warehouse, mill, farm, forest, mine, oil well.</p> <p>Family cooperation in obtaining a living.</p> <p>Acquaintance with workers in the community: farmer, doctor, minister, lawyer, barber, mason, carpenter, storekeeper, unskilled laborer, executive.</p>	<p>Construct mill, oil well, etc., as part of model community.</p> <p>Illustrate occupations. Construct tools used in some instances.</p> <p>Finding what each worker does and how they work together; learning what each does to help us live well.</p>

Areas of Human Experience	Suggested Emphases in the Social Studies Program	Emphases in Industrial Arts
Making a home	<p>Kinds of houses in the community.</p> <p>How houses in the community may be made more livable.</p> <p>Home life on the farm or in the city.</p> <p>Activities of the home: caring for dolls, telephoning, washing, ironing, cooking, cleaning, furnishing the home, sewing.</p>	<p>Construct houses for use in the classroom. Live in the house and carry on home activities: cooking, sewing, etc. Emphasize human relationships in the home.</p> <p>See content relative to <i>food, shelter, clothing, utensils</i>, and <i>tools</i> for these grades in Chart 1.</p>
<p>Expression of spiritual and emotional impulses</p> <p>Expressing esthetic impulses</p>	<p>Expression of religious life in the community: churches, home, and school.</p> <p>Improvement of the appearance of the environment: school buildings and grounds, home and surroundings, community.</p> <p>Writing poems, plays, music.</p> <p>Painting, drawing, modeling.</p> <p>Hearing and appreciating poetry, music, drama.</p> <p>Participation in dancing, singing, dramatizing.</p> <p>Observing and making beautiful things.</p>	<p>Visit churches to sense how materials have been used for spiritual values.</p> <p>The art elements of all materials observed or made should be emphasized.</p> <p>Making costumes and marionettes.</p>
Securing an education	<p>Experiences with radio, motion pictures, library, church, museum, parks, trips, newspapers and magazines, school, county and state fairs.</p>	<p>The content relative to <i>records</i> for grades I-III can be used here; see Chart 1.</p>
Cooperating in social and civic action	<p>Home and community cooperation for community improvements, fire prevention week, community chest, Christmas seals, welfare fund.</p> <p>Visiting and learning about the functions carried on in public service buildings: post office, court house, library, city hall, band.</p>	<p>Groups of children will learn to work cooperatively in enterprises. As they learn how materials are made, they learn that people in the world work together for a common good.</p> <p>Construct models of buildings studied.</p> <p>Learning to take care of materials in classroom.</p>

Areas of Human Experience	Suggested Emphases in the Social Studies Program	Emphases in Industrial Arts
Cooperating in social and civic action	<p>Improving the classroom environment by keeping the room orderly and clean, beautifying the room, and formulating standards for group living.</p> <p>Improving the classroom environment by building interest centers such as library, science, and museum centers or centers growing out of instructional units.</p>	Active participation in improving room. Building and arranging interest centers in classroom.
Adjusting to and improving the material environment	<p>Selection and care of toys and work materials. How people have improved and adapted themselves to geographic conditions in the community: food, clothing, shelter.</p> <p>The transportation of people and goods in the community: boats, aeroplanes, trains, buses, wagons, bicycles, motorcycles.</p> <p>Money as a medium of exchange.</p>	The entire content of the industrial arts for the primary school enters here; see Chart 1.
Engaging in recreation	<p>Community recreation and recreational centers: parks, playgrounds, theatres, community halls.</p> <p>Engaging in recreation: games, movies, parties, picnics, festivals, fishing, boating, swimming, hiking, reading, singing.</p> <p>Playing with toys.</p> <p>Manipulative and creative play.</p>	<p>Interest in industrial arts may turn it into a hobby.</p> <p>Construct own toys; repair toys; find how toys are made.</p> <p>Interest in making things: weaving, clay modeling, booklet making, block printing, marionettes.</p>

SUGGESTIVE EMPHASES IN THE SOCIAL STUDIES AND INDUSTRIAL ARTS PROGRAM IN RELATION TO AREAS OF HUMAN EXPERIENCE

For Later Elementary Grades IV, V, VI

Center of Emphasis: Exploring and Adventuring in an Expanding Environment

Areas of Human Experience	Suggested Emphases in the Social Studies Program	Emphases in Industrial Arts
Protecting and improving life, health, and property	<p>Community and state agencies for the protection and improvement of life and health.</p> <p>The prevention and control of communicable diseases.</p> <p>The progress of science in combating disease and caring for the body.</p> <p>Community and state agencies for the protection and improvement of mental, emotional, and social health.</p> <p>The art of healing in other places and times.</p> <p>Provision for an environment conducive to personal health.</p> <p>Eradication of pests and disease-carrying insects.</p>	<p>Excursions to observe community agencies.</p> <p>Construct model of improved community development.</p> <p>Study of food, shelter, and clothing as suggested under A, with special emphasis upon improved life and health.</p>
Earning a living	<p>Production and marketing of commodities in Pennsylvania.</p> <p>The interdependence of members of society in obtaining a living.</p> <p>How people in other places and other times obtained a living.</p> <p>Physical conditions and natural resources which contribute to obtaining a living in our own and other lands.</p> <p>Types of professional and service occupations: lawyer, doctor, teacher, barber, beautician.</p>	<p>Construct models of shops and markets after observing them.</p> <p>Illustrate various occupations; place emphasis upon how various peoples work together to make living conditions better.</p>

Areas of Human Experience	Suggested Emphases in the Social Studies Program	Emphases in Industrial Arts
Making a home	<p>Houses in other places and other times. Responsibility of members of the family to the home. Customs and manners in the home and in the community. Home life in other places and other times. How houses in the community can be made more attractive and convenient.</p>	<p>Construct and observe models; various materials. Free illustrations and model of diorama. Make plans and models of houses. Consider pleasing color.</p>
Expressing spiritual and emotional impulses	<p>Expressing spiritual impulses in art, architecture, music, the dance, drama, writing, speech. Organizations cooperating in developing the spiritual life of the community.</p>	<p>Illustrate—construct example of architecture. Awareness of spiritual sentiment expressed in buildings, books, and other materials.</p>
Expressing esthetic impulses	<p>Planning a more beautiful community, including the school and the environment. Architectural designing, present and past. How other peoples express esthetic impulses. Seeing and expressing beauty in natural scenery. The collection and preservation of art treasures.</p>	<p>Art elements in materials made by man should be emphasized. Making the schoolroom and grounds more attractive. Observing and collecting for school museum beautiful objects made by man for practical purposes. Emphasis upon art elements in craft activities of children.</p>
Securing an education	<p>Educational opportunities through informal agencies in the community. Organized educational agencies in the community and state. Educational opportunities through school clubs, assemblies, and other extra-class activities.</p>	<p>The content relative to <i>records</i> for grades IV-VI is appropriate; see Chart 1. Emphasis upon having the child engage in industrial arts activities which mean growth to him.</p>

Areas of Human Experience	Suggested Emphases in the Social Studies Program	Emphases in Industrial Arts
Securing an education	Recognition and interpretation of learning experiences in the classroom.	Seeing significance of man-made articles to the development of the race.
Cooperating in social and civic action	<p data-bbox="184 717 263 1284">Non-governmental agencies and services in the community and their relationship to public welfare.</p> <p data-bbox="263 835 296 1284">How the community pays its expenses.</p> <p data-bbox="296 717 352 1284">Great leaders, present and past, in American social, economic, and political life.</p> <p data-bbox="352 717 408 1284">Participation in a democratic government of the school.</p> <p data-bbox="408 717 487 1284">The individual and his relationship to public welfare: the home, the school, the community, and the state.</p> <p data-bbox="487 717 543 1284">Participation in a democratic government of the school.</p> <p data-bbox="543 717 621 1284">The individual and his relationship to public welfare; the home, the school, the community, and the state.</p> <p data-bbox="621 717 688 1284">Participation in activities for the welfare of the local community.</p>	<p data-bbox="201 83 235 650">Working together cooperatively in small or large groups in accomplishing common purposes.</p> <p data-bbox="235 83 319 650">Learning how men work together to change materials to worthwhile products.</p>
Adjusting to and improving the material environment	<p data-bbox="700 748 733 1302">Natural resources of our own and other lands.</p> <p data-bbox="733 729 789 1302">The production of food, clothing, and shelter in other places and other times.</p> <p data-bbox="789 896 823 1302">Exploration by land, sea, and air.</p> <p data-bbox="823 872 856 1302">The making and keeping of records.</p> <p data-bbox="856 729 912 1302">Great inventors and inventions in the fields of science and mechanics.</p> <p data-bbox="912 729 959 1302">Transportation facilities in our own and other times.</p>	The entire content of industrial arts for grades IV-VI is included; see Chart I.

Areas of Human Experience	Suggested Emphases in the Social Studies Program	Emphases in Industrial Arts
Adjusting to and improving the material environment	<p>The effect of different geographic and climatic conditions on peoples and natural resources.</p> <p>The use of money in our own and other lands and times.</p> <p>Community and state agencies for the protection and improvement of property and natural resources.</p>	<p>For some children interests in industrial arts will become real hobbies.</p>
Engaging in recreation	<p>Recreational centers and recreational activities in the community and in an expanding environment.</p> <p>Recreational facilities and opportunities in our own and other times.</p> <p>The extension of opportunities for recreation and leisure time activities, including clubs and organized groups.</p> <p>The utilization of leisure time in constructive recreational activities.</p> <p>Making of toys in our own and other times.</p> <p>Collection of coins, stamps, Indian relics.</p> <p>Development of hobbies.</p>	<p>Reading for pleasure about the industrial world.</p> <p>Craft clubs may be organized to provide opportunity for manipulative and creative activities.</p> <p>This also includes the study of materials made by man for recreational purposes: sporting goods, toys, books, etc.</p> <p>Collections of various man-made articles for pleasure purposes: stamps, Indian relics, watches, dishes, boat and airplane models, etc.</p>

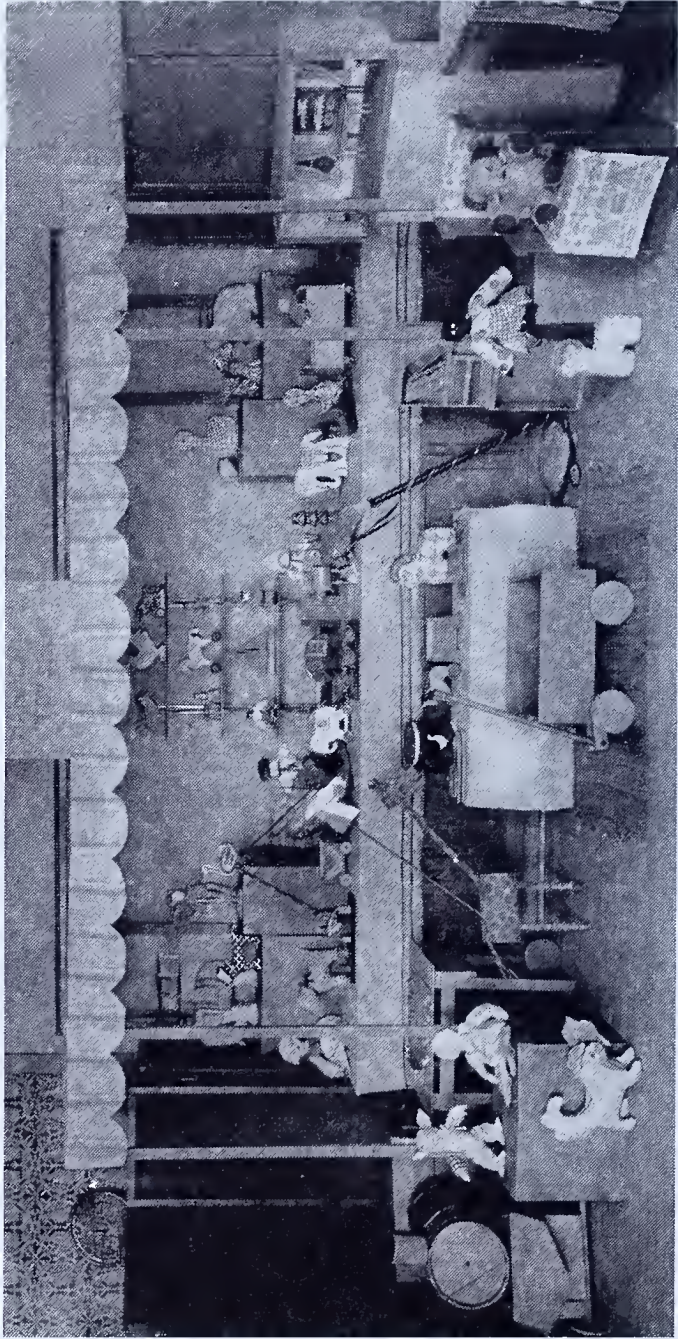
12. Growing out of Pennsylvania industries: Mining, lumbering, etc.
13. Life among peoples of other times and places: Indians, Eskimos, Hebrews, Pastoral life, Colonial life, etc.

These are but a few examples. Space is not here available for an exhaustive list. In almost any unit which is chosen, industrial arts will have some integral part.

The Industrial Arts Cooperative Service, 519 West 121st Street, New York City, is a valuable agency for helping teachers to share experiences in industrial arts teaching. From this source, not only useful materials can be obtained, but also many written descriptions of units which have been developed successfully in classrooms. Just a glance at the catalog suggests to the teacher a vast range of possibilities.

D. RELATIONSHIP TO SPECIAL DAYS

Observation of special days often offers opportunities for industrial arts activities. Chart 4 illustrates this by listing some of the possibilities and attendant outcomes to be expected relative to Hallowe'en, Thanksgiving, and Christmas.



A TOY SHOP. FRICK TRAINING SCHOOL, 1934

SPECIAL DAYS IN RELATION TO INDUSTRIAL ARTS EDUCATION

CHART 4

Hallowe'en		
Objectives	Procedure	Outcomes
To enter into the spirit of Hallowe'en, and make one's own mask, costume, and appropriate decorations.	With paper sacks, wrapping paper, and other materials to make one's own mask, with humorous, exaggerated features, and decorate with gay colors.	Joy in working together. New experiences in shaping and constructing materials.
To make free illustrations of Hallowe'en events.	Design and make cutouts and objects for decorating the schoolrooms. Design and make original costume for Hallowe'en parade.	Economy in making one's own mask and costume.

Thanksgiving		
Objectives	Procedure	Outcomes
To take advantage of all the handwork growing out of a study of Thanksgiving, past and present, and the Pilgrims and their first Thanksgiving.	Collect illustrations related to Thanksgiving. Model farm animals, fruits, and vegetables related to the harvest season, and paint when dry. Develop in various materials models of Pilgrims, their homes, clothing, etc. Make a stockade—the Mayflower, and assemble in an interesting table group.	Pleasure in working together in the Thanksgiving spirit. A better understanding of early hardships compared with our present comforts. Increased skill in working with new and varied materials.

Christmas Activities		
Objectives	Procedure	Outcomes
To plan, design, and make gifts for friends and relatives.	Consideration for the choice of the best materials and plans for making toys and a wide range of gifts chosen for family and friends.	Increased skills in manipulating a variety of tools and materials.
To plan, design, and make appropriate objects for the decoration of Christmas tree, schoolroom, and home.	There will be greetings cards, calendars, and booklets that may require linoleum block printing.	The pleasure in working together in making gifts for others.
To make one's own greeting cards and decorated wrapping paper.	All articles should be attractively colored with crayons or paints.	The pleasure in receiving gifts specially planned and made by hand.

III. THE HANDICRAFTS OF INDUSTRIAL ARTS

"It is good that large numbers of people should be craftsmen, not because there is the smallest prospect of their producing a correspondingly large number of good works of art, but because craftsmanship is something that most men and women find psychologically satisfying. A society of craftsmen is a society of satisfied individuals, and a society of satisfied individuals tends to be a stable society."

—*Aldous Huxley*

A. VALUES OF HANDICRAFTS

It is understood that man has always found pleasure in making things with his hands. We read much of the craftsman of old who found joy in his work, and much of such art preserved today expresses such pleasure. The pleasure of planning a piece of work for some purpose, and then contemplating the completed article, provides a great satisfaction. It may be expected that experiences in the school will provide the necessary equipment for all manner of home enterprises, and a happy solution for the problem of leisure time employment.

Creative experiences with various tools and materials cultivate intelligent attitudes, appreciations, and judgments toward men's efforts, past and present, to transform raw materials into completed art products. These personal experiences lead to an intelligent interest in the social habits and life situations of various peoples and their efforts to improve living conditions, and add to man's material and cultural enrichment.

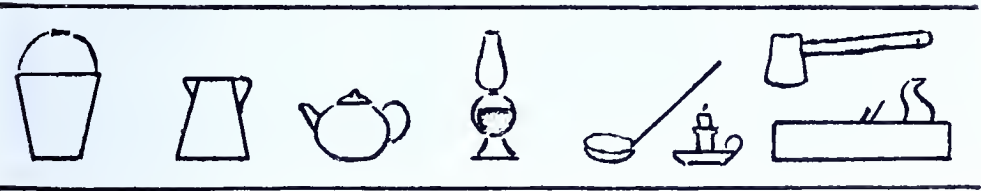
As raw material is manipulated to meet man's social and industrial needs, the profit therefrom advances as it is raised to higher levels of service and esthetic satisfaction.

The discriminatory faculties and fine appreciation are best developed through actual participation, so that through one's own experience the work of others is understood and valued according to its appropriateness, quality, and beauty. Within the limits of the child's ability, it is important that this creative work be well planned and executed, with a consideration for appropriateness of tools, materials, and service, and a regard for fine design and craftsmanship. Efforts should be made to know, understand, and enjoy the best in all times and places, but it is by way of experience that one appreciates most fully. For example, one's work in clay gives one an understanding of the sculptor and his statue, or of the potter and his craft. The process of hammering metal or the art of wood carving gives experiences that provide a real appreciation of fine carvings or fine metal crafts. In like manner, one becomes a real appreciator of a fine handbound book, or a tooled leather bag.

In developing a program of integration with its purposeful activities and units of experience various tools, materials, and processes are involved. While these varied experiences are provided as the occasion and need arises, thought must be given to the selection of the most appropriate and fitting tools and materials in each case, and to progressive growth

in techniques and skills as well. The completed product should reveal consideration for neatness and beauty and good craftsmanship. Judgments must be exercised in deciding between some activities that may be classed as “stunts” and trivial in character, and other activities that may be regarded as basic arts with unquestionable educational values, as for example, clay modeling, paper and cardboard construction, booklet making, basketry, and weaving. Guiding principles and practices in developing these activities should have consideration.

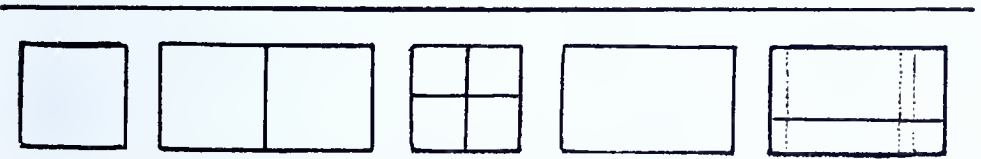
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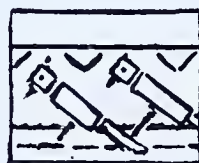
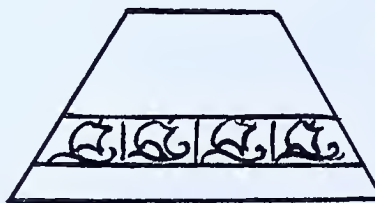
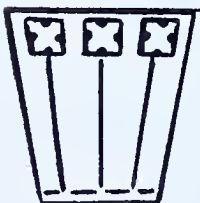
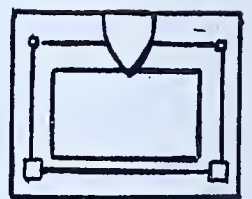
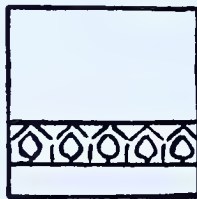
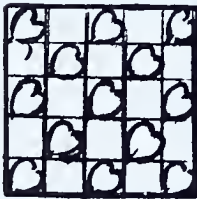
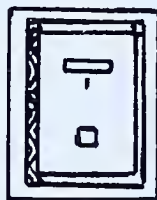
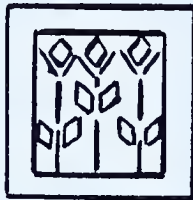
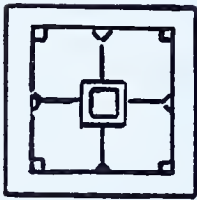


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B. DESIGN AND COLOR IN CONSTRUCTIVE HANDWORK

Man has not only fashioned articles from materials at hand to meet his needs, but he has felt also the urge to beautify the product of his labor. Young people feel a similar urge today, and the thoughtful designing of the article to be made is important if fitness to purpose and beauty in appearance are to be secured.

·DECORATIVE·DESIGN·



Design has two distinct phases—one, the constructive, and the other, the decorative. Frequently these two elements are interwoven or bound together. Constructive or structural design concerns itself with the use of the object, line, proportion, and form that will result in beauty of appearance. Decorative design has to do with the further enrichment of the object, and this should add interest and attractiveness and not detract from the usefulness of the object. This decoration should be related to structural elements and be as simple as possible.

As attractive color and color combinations are essential in decoration, attention should be given to color arrangements and combinations that have been studied in order that the most pleasing results may be obtained.

Every home has its treasures—an old Pennsylvania dower chest, a chair, some examples of fine pottery and glass, early metal craft, or a hooked rug or woven coverlet. These may be collected for a school exhibit to teach values of fine design and craftsmanship. Some who have come from other lands are usually happy to contribute examples of their art as a setting for enterprises that may be carried on in geography and the social studies.

C. TYPES OF HANDICRAFTS

1. BASKETRY AND WEAVING

While primitive man was engaged in hunting and fighting, woman, ever the homemaker, was engaged in the peaceful arts. She was the mother of many crafts as needs had to be met for shelter, clothing, fishing nets, pots, baskets, and other necessary articles.

Chief in importance were the crafts of basketry and weaving. These were done with such skill and design that we can hardly hope to improve on the weaving art of earlier times. Furthermore, these primitive workers laid foundations for the large textile industries of today. It is interesting to study the symbolic designs in early basketry and weaving, and to learn something of religion and folk lore woven by our own American Indians and other races.

Children may make their own looms in each grade and develop a woven product appropriate to their years and needs.

Various units of work require examples of weaving.

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2. BOOKLET MAKING

A beautifully bound book is truly a work of art, and a booklet well made at each grade level not only provides a booklet for "Health," "Indian Life," or "Foreign Lands," but leads to a live interest in book manufacture and regard for a fine book.

There is a type of binding suitable to each grade, and the activity requires exactness in measurements and skill and neatness in execution, together with appropriate lettering, design, and color.

If possible, a journey to a bookbinder's shop should be arranged. This activity will suggest a study of the evolution of the book and the history of man's records and means of communication.

Beginning in the first grade with a simple folder, a booklet can be made in each succeeding grade providing for growth in skills and experience over the previous grade.

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3. CLAY MODELING AND POTTERY CRAFT

Clay modeling, if not the oldest, is one of the oldest of the arts. Modeling material is generally available and because of its plastic, responsive nature, is a sympathetic and pleasure-giving material for young people from the mud pie days through the elementary grades. In shaping clay, children deal with real form rather than imitations of masses and shapes. It is peculiar in that it is a building up process and the very opposite of most other processes. In various types of projects, clay can probably be used in more ways to answer more purposes than any other one material.

Clay may be secured from local sources, from potteries, and art supply houses. Natural clay is one of the pleasantest and most inexpensive of materials. Plasticine and other similar plastic materials in several colors are likewise available.

The plastic clay may be kept in a covered waste can or in a covered box. If the moisture is applied gradually, the result is a fascinating plastic substance and not a sticky or mud-like substance. When objects of natural clay are dried, color may be applied, adding to the interest and appearance.

In addition to people and animals, objects such as a wigwam, log cabin, or other buildings can be likewise executed in clay. As pupils advance through the elementary grades, there should be growth in abilities to model animal, human, and other figures with more understanding of form, action, and likeness. Low relief plaques may be made illustrating stories from history and literature. Various units of work call for appropriate pottery forms and the pupil's experience leads to an interest in the pottery industry of today as well as that of the ancient Egyptians or the American Indians.



CLAY MODELING AND POTTERY CRAFT

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4. LEATHER CRAFT

Records from the time of the early Egyptians reveal the wide use of leather for clothing, furniture, shields, ornamentation, and other purposes. The early American Indians had developed the art of tanning, and we are familiar with their present use of leather for clothing and decoration.

Leather tooling has been popular as a school craft because of the interest in the work itself and also because of the practical value of the many leather objects such as purses, bill folds, memorandum pads, belts, and others.

While leather tooling is generally carried on in secondary years, there are small objects that may be made with limited equipment in the intermediate grades. A nut pick, dental tool, or knitting needle is very satisfactory for tooling.

Leather thongs and rawhide handicraft might be included. Indians and cowboys have braided leather for various uses, and it has been particularly attractive in Scout organizations. Leather craft should stimulate interest in the history of the craft, and such units as "Indian Life" and other primitive life would naturally lead to leather and its various uses. The moccasin for personal use is an appropriate project.

The use and beauty of leather objects, together with the fascination of working in leather, combine to make the craft an ever popular one. Young people should be led into the attractions of this craft by a study of its history and romance.

Leather work can be carried on with comparatively few tools and little expense.

Pupils in fifth and sixth grades may be taught to do work in leather, simple in design, with merely steel or wooden stamps for the background following the tracing of the design on the leather. The best leathers are tooling sheep and calfskin. The article may be colored with colored crayons or dyes, and then polished with wax. Leather work will be required in a number of units of work, such as Indian Life.

Suggested articles :

Pen wipers
Pencil cases
Book marks

Scissors cases
Stamp books
Belts

Key cases
Purses

In leather tooling or stanping, the idea is to make an impression of the design which will be permanent and enrich the appearance of the object. Bark tanned leathers are the best. Color or stain can be applied only to natural, unglazed leather. Margins sufficient for sewing or lacing should be planned for in advance. In transferring the design, a tracing may be made on the smooth surface of the leather laid on glass, marble, or metal rather than wood.

Modeling tools, nut picks, knitting needles, and similar tools may be made to meet the tooling needs. The leather is dampened with clean, cold water for tooling operations.

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5. LINOLEUM BLOCK PRINTING

The story of wood cuts will carry one back to the early days of printing in European countries and into China and Japan, famous for their wood blocks.

Linoleum cutting and printing is a modern development of wood block printing. Linoleum has no grain to splinter and is well adapted to the needs and limitations of young people.

The manufacture and general use of linoleum in our homes today has provided admirable craft material for boys and girls in elementary

grades. Both the cutting of the linoleum block and the printing as well provide a fascinating experience. "Battleship" linoleum is preferred and remnants may be secured from local stores or possibly the home.

After the design has been applied to the linoleum, the background may be cut out with an ordinary knife, or with tools specially made for the purpose, known as linoleum cutters. The linoleum is mounted upon a block for printing in a power press but if not mounted, the inked linoleum can be run through an old-fashioned clothes wringer or pressed in various ways by pounding, or even stepping upon it.

The design may be applied to paper or fabric materials. Christmas cards, calendars, and book plates prove engaging and attractive problems. The block may be applied to fabrics and will produce pleasing scarfs, table runners, and pillow covers. Particularly important is the choice of pleasing colors. It is hardly necessary to call attention to the relation that exists between block cutting and printing and the history of records and communication.

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6. MARIONETTES

The fascinating Punch and Judy Show of an earlier day has developed into the puppet and marionette show so popular in the elementary schools of today.

Puppets are generally operated by hand and known as "glove puppets," while the marionettes are jointed and usually worked by strings which provide for the action so dear to the hearts of children. Still the "puppet show" is a term in general use and the operator a "puppeteer."

We have here, primarily, a fine type of constructive handwork, and the imagination is exercised in the selection of materials for the marionette and the costume.

There are further skills and inventions required in the stage setting, properties, and scenic effects. Furthermore, there is no better medium for integration of English, history, and other school subjects with music and art. Both puppets and costumes have been made of every conceivable material, and appropriate means may be found for each grade.

One primary grade discovered that corn cobs could be cut for head, body, and legs, and jointed by small staples or paper clips.

There is no limit to the possibilities. Naturally it would be desirable to have the children witness a puppet show.



PUPPETEERS

7. MASK MAKING

The making of masks has become a popular activity in various school levels. Children will be fascinated with the history and story of masks dating from earliest times, and they should have this background of information. From the tombs of ancient Egypt, they may be traced through Greece, Rome, China, Japan, and the religious ceremonies of many aboriginal tribes to our own American Indians. The symbolic Greek masks of Comedy and Tragedy lead to the mask in our modern drama and its use in school plays and masquerades.

Why not let the children design, construct, and paint their own Hallowe'en masks? Natural clay or plasticine is used in modeling the face on a board. When the clay dries, the model is covered with strips of paper toweling or newspaper soaked in water and soaked in paste. The dry clay should be greased with vaseline and then the strips of wet paper carefully laid over the model and pressed in all the crevices.



HALLOWE'EN MASKS

Layers may be added to secure the thickness desired. Allow the mask to dry. Remove, trim, cut desired opening, shellac and paint with tempera paints, then shellac the painted surface.

REFERENCES

- KNIFFIN, HERBERT. *Masks*. Peoria, Illinois: Manual Arts Press, 1931.
 MACGOWAN, KENNETH AND ROSSE, HERMAN. *Masks and Demons*. New York City: Harcourt, Brace and Company, 1923.
 MILLS, H. W. AND DUNN, L. M. *Marionettes, Masks and Shadows*. Garden City, New York: Doubleday, Doran and Company, 1927.
 W. P. A. *Puppeteers Handbook*. Pittsburgh, Pennsylvania: WPA Museum Projects.

8. METAL CRAFT

The use of metal by so many people for so many purposes gives it some importance in an elementary industrial arts program as various units are developed. Some simple projects with simple equipment may be developed in the fifth and sixth years. Very interesting things have been made from such waste material as tin cans, and small pieces of copper and aluminum may be shaped into very useful objects, such as brooches, belt buckles, fobs, trays, rings, napkin clips, and others.

The Indian life unit leads to an interest in Indian silver ornamentation and Indian silversmithing. Other units will lead to similar metal crafts.

We have been accustomed to think of the discarded tin can as the most useless object and fit only for the refuse barrel. Some have had visions of many useful and attractive objects that might be made from tin or the tin can and thus provide metal craft with inexpensive or waste material and with a few simple tools.

Many objects require no soldering or heat treatment and but very simple operations with a few tools that can be purchased at the five- and ten-cent store.

Plant containers, book supports, candle sticks and sconces, bowls, ash trays, and bracelets are a few of the numerous articles that can be made pleasantly and inexpensively.

REFERENCES

- BELL, ENID. *Tin Craft as a Hobby*. New York City: Harper Company, 1935.
 BOY SCOUTS OF AMERICA. *Metal Work*. New York City: 2 Park Avenue.
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 HAMILTON, EDWIN T. *Popular Crafts for Boys*. New York City: Dodd, Mead and Company, 1935.
 PAYNE, A. F. *Art Metal Work with Inexpensive Equipment*. Peoria, Illinois: Manual Arts Press, 1914.
 ROSE, A. F. *Copper Work*. Providence, Rhode Island: Metal Craft Publishing Company, 1931.
 THATCHER, EDWARD. *Making Tin Can Toys*. Philadelphia: J. B. Lippincott Company, 1919.

9. PAPER AND CARDBOARD CONSTRUCTION

This activity has always been a very popular one among children. There is a fascination in cutting, pasting, and constructing. There is not alone the need for envelopes, folders, doll furniture, booklets, and boxes; but measuring, arithmetic, design, color, appearance, and careful and neat execution are all involved.

Inventiveness, ingenuity, and creativeness should all be encouraged.

The development of manufactured cardboard containers and the marked improvement in their color and design are not alone stimulating to school problems, but lead to an interest in factory products.

Cardboard furniture, boxes, and buildings are required in various units of work and such constructive experiences prepare the way for similar construction in other materials.

REFERENCES

- BUXTON, G. F. AND CURRAN, F. L. *Paper and Cardboard Construction*. Peoria, Illinois: Manual Arts Press, 1913.
- TRYBORN, J. H. *Cardboard Construction*. Philadelphia: Milton Bradley Company, 1902.
- WILSON, DELLA F. *Primary Industrial Arts*. Peoria, Illinois: Manual Arts Press, 1936.

10. SOAP SCULPTURE

Soap carving provides with inexpensive, generally available material, an experience similar to that of the sculptor working in stone or marble. Clay modeling is a plastic, building-up process, while soap carving is a cutting-away process to release interesting form. Young people should be made acquainted with this art—perhaps the oldest and most common. It can be traced from the dawn of history through idol and image making, and later through the Egyptians, Greeks, and Romans down to the sculpture we see about us today.

There might be introduced also something of the romantic experiences of Cellini, Michael Angelo, and others. A pocket knife or an orange stick will answer for tools. Various animals and other objects may be carved “in the round” or three dimensions, or a relief or comparative flat carving may be made to illustrate a topic related to some school subjects.

REFERENCES

- NATIONAL SOAP SCULPTURE COMMITTEE. *A Little Book of Soap Sculpture*. New York City: National Soap Sculpture Committee, 80 East Eleventh Street.
- PROCTOR AND GAMBLE. *Teachers' Plans and Designs for Soap Sculpture*. Cincinnati, Ohio: Proctor and Gamble.

11. TEXTILE DECORATION

Plain textile fabrics may be enriched by design and color in several ways, each involving an interesting craft experience. The design and color may be applied by means of the cut stencil, the linoleum block, the tie and dye operation, or batik. The stenciling operation is relatively simple. Linoleum block cutting and printing are discussed with suggested reference books on pages 38 and 39. With the tie and dye method, the fabric is tied with string according to the desired repeat, the material is dyed and the string is removed, revealing what should be a very interesting pattern. Batik is a popular method of fabric decoration and has come down to us from the Javanese, where the art has been practiced for centuries, and applied especially in the decoration of their wearing apparel. Batik is a method of drawing a painting upon a fabric with melted wax, after which the material is dyed and the wax removed. The result is a decoration upon the dyed background of the goods.

Products:

Scarfs, handkerchiefs, handbags, table covers, sash curtains, wall hangings, and wearing apparel.

REFERENCES

- CORBIN, T. J. *Hand Block Printing on Fabrics*. New York City: Pitman Publishing Corporation, 1935.
- MICKEL, ADELAIDE. *Stenciling*. Peoria, Illinois: Manual Arts Press, 1920.
- MIJER, PIETER. *Batiks and How to Make Them*. New York City: Dodd, Mead and Company, 1919.

12. WOODCRAFT

Appropriately included in an elementary industrial arts program is thin woodworking. Thin basswood, manufactured board, or even cigar boxes may be used, and a coping saw and blades obtained from the ten-cent store will be satisfactory.

All sorts of animals and birds, clowns, and other interesting shapes are carved, painted, and mounted. A visit to a toy shop will suggest a number of simple, movable toys that can be made with limited equipment. Occupations, transportation models, and costumed figures suggested by geography may be developed in thin wood.

REFERENCES

- ADAMS, JOHN D. *Carpentry for Beginners*. New York City: Dodd, Mead and Company, 1917.
- BAXTER, L. H. *Boy Bird House Architecture*. Milwaukee, Wisconsin: Bruce Publishing Company, 1920.
- BOY SCOUTS OF AMERICA. *Knife Craft*. New York City: 2 Park Avenue.

- BOY SCOUTS OF AMERICA. *Totem Poles*. New York City: 2 Park Avenue.
- FAULKNER, HERBERT W. *Woodcarving as a Hobby*. New York City: Harper and Brothers, 1934.
- HUGHES, F. CLARKE. *Hand Work for Boys*. Milwaukee, Wisconsin: Bruce Publishing Company, 1926.
- KLENKE, W. W. *Things to Make for the Home*. Peoria, Illinois: Manual Arts Press, 1935.
- KLENKE, W. W. *Things to Make for the Lawn and Garden*. Peoria, Illinois: Manual Arts Press, 1935.
- KUNOU, C. A. *Easy to Make Toys*. Milwaukee, Wisconsin: Bruce Publishing Company, 1928.
- LEMONS, JOHN T. *New Ideas in Woodcraft*. Pelham, New York: Bridgman Publishers, 1938.
- MOORE, HARRIS W. *Chip Carving*. Peoria, Illinois: Manual Arts Press, 1922.
- SOWERS, J. I. *Woodcarving Made Easy*. Milwaukee, Wisconsin: Bruce Publishing Company, 1936.
- TESSIN, LOUISE. *Woodworking Patterns of Attractive Toys and Practical Crafts*. Philadelphia: Milton Bradley Company, 1929.
- UNITED STATES DEPARTMENT OF AGRICULTURE. *Homes for Birds*. Farmers Bulletin No. 1456. Washington, D. C.: U. S. Government Printing Office.
- VON HOFER, T. *Chip Carving*. New York City: Universal School of Handicrafts, Rockefeller Center, Sixth Avenue.
- WESTERN PINE MANUFACTURERS ASSOCIATION. *Woodcarving for Pleasure*. Portland, Oregon: Western Pine Manufacturers' Association.
- WILSON, DELLA F. *Primary Industrial Arts*. Peoria, Illinois: Manual Arts Press, 1936.
- WRIGHT, HARRY B. *Toys Every Child Can Make*. Milwaukee, Wisconsin: Bruce Publishing Company, 1927.

13. THE DIORAMA

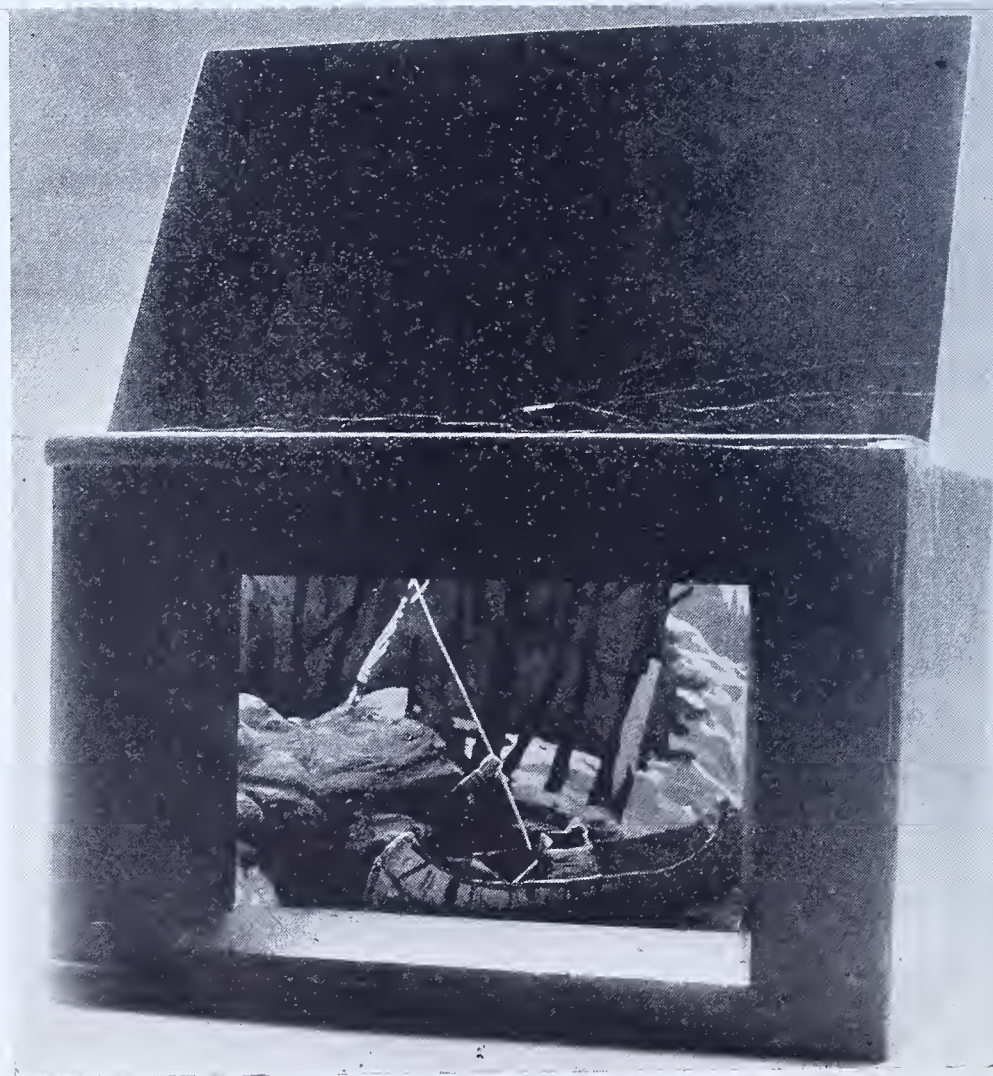
The word "diorama" is derived from the Greek, meaning "to see through." Such models, with various lighting effects, are seen in our museums. The diorama, somewhat like a small stage setting, becomes an interesting project for elementary grades.

In a small box with glass front and top open for lighting are placed colored models and painted scenes, and circular background. The project requires modeling, constructing, and painting. Such subjects as Indian life with Indians hunting, weaving blankets or dancing; medieval life; or early Pennsylvania industries are well adapted to the diorama. Placed on the window sill for lighting, it becomes an object of lasting interest.

The diorama may be thought of as a picture in three dimensions, and may be built into a wooden or pasteboard box; even a shoe box will serve the purpose. The diorama should express a single idea with a



A DIORAMA MODEL



THE DIORAMA

single center of interest. The following are suggestive of a wide range of fitting diorama problems:

Indian life:

Pottery making.

Weaving.

Hunting.

Transportation—water or land.

Cabin interior.

Colonial life.

A room showing good interior decoration.

In the lower grades figures, buildings, and trees may be cut from cardboard, painted, and mounted in proper position. The background is generally curved and this curved background of cardboard is painted to represent the more distant views.

In intermediate grades, a variety of modeling and other materials will be selected to represent people, animals, dwellings, trees, mountains, lakes, rivers, and bridges. The lighting effects will stimulate further creative effort.

Dioramas are supplied to schools without charge by the WPA Museum Project, 46 North Cameron Street, Harrisburg, Pa.

D. SUGGESTED EQUIPMENT AND SOURCES OF TOOLS AND SUPPLIES

1. A SEPARATE ROOM

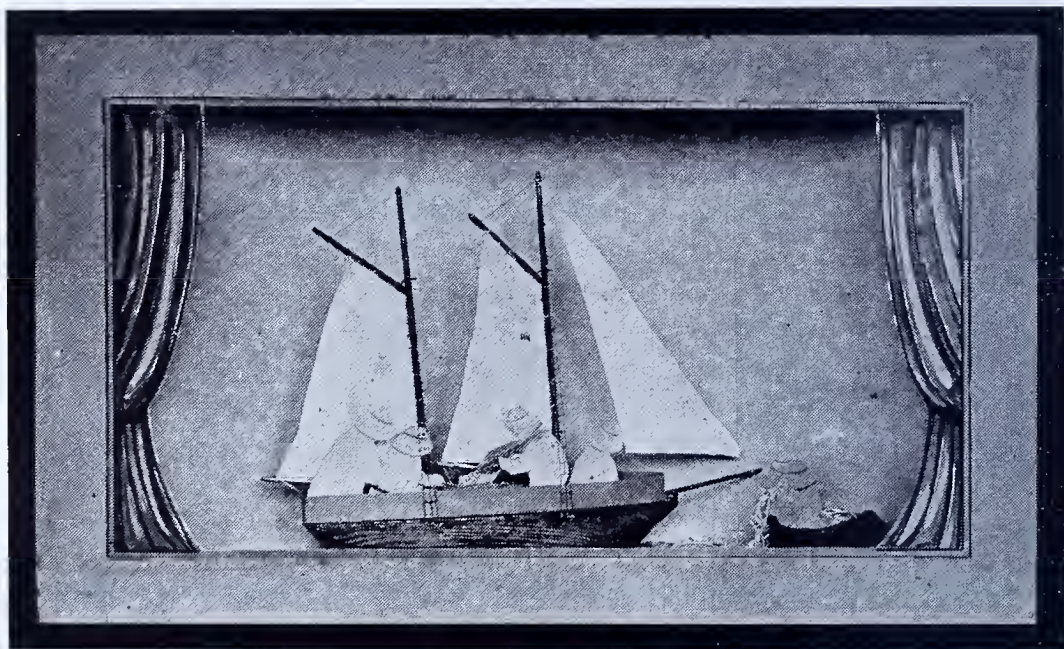
While numerous activities can be carried on in the regular classroom, it is desirable to provide in each school building a room equipped for the elementary industrial arts for all of the first six grades.

Children are benefited by the stimulating change from the classroom to the special room with its inviting tools and materials. Furthermore, the economy in equipping one room rather than a number is worthy of consideration.

Substantial tables or work benches of several heights will answer for a variety of work including modeling, wood and metal work, and others. There should be adequate closets and storage cabinets for supplies and pupils' work, and special containers for clay. A sink and running water are indispensable.

There will be need for a few hammers, mallets, saws, screw drivers, brace and bits, and similar carpenter tools to meet a variety of needs.

Looms will be required for weaving, but can be purchased at relatively small cost or made by the group. The cost of equipment necessary for modeling pottery, metal, leather, and linoleum craft, as well as toy



A DIORAMA MODEL



A DIORAMA MODEL

making and thin wood working is moderate. The ten-cent store offers a surprising number of tools and materials such as bench vises, pliers, coping saws, files, paints, and brushes which are quite satisfactory, and additions may be made as necessity arises.

Along with adequate equipment should go active consideration for the attractive appearance of the room. There should be appropriate and framed color prints, wall hangings, colorful pieces of pottery, book supports, and similar objects of decoration. Many of these objects can be made by the pupils. The modeling and pottery work, block printing, and wood working and metal craft can all serve in the creation of decorative objects providing a stimulating and cheerful environment that should add much to the spirit of various creative experiences.

2. SOURCES OF HANDICRAFT TOOLS AND MATERIALS

The following list contains the names of commercial houses that have come to the attention of the Department of Public Instruction as handling furniture, tools, and materials of interest to school officials. The list is not complete; it is not intended to be preferential, but to be helpful in giving information as to sources of equipment and supplies.

Basketry Materials (Reed, Raffia, Cane, etc.)

American Reedcraft Corporation, 130 Beekman Street, New York City.

Dennison Paper Company, Philadelphia, Pennsylvania.

Edward E. Babb and Company, Philadelphia, Pennsylvania.

Grand Rapids Fibre Cord Company, Grand Rapids, Michigan.

J. L. Hammett Company, Newark, New Jersey.

Louis Stoughton Drake Company, Inc., Boston, Massachusetts.

Bookbinding

Crafts Supply Company, The, 207 West 16th Street, New York City.

Edward E. Babb and Company, Philadelphia, Pennsylvania.

National Crafts Supply Company, The, 94 Lexington Avenue, New York City.

Milton Bradley Company, Philadelphia, Pennsylvania.

Clay Modeling and Pottery

American Art Clay Company, Indianapolis, Indiana.

American Crayon Company, Sandusky, Ohio.

Binney and Smith Company, New York City.

Milton Bradley Company, Philadelphia, Pennsylvania.

Fellowcrafters, Inc., 64 Stanhope Street, Boston, Massachusetts.

Claycraft Company, Columbus, Ohio.

Clay from nearest pottery.

Leather, Tools and Findings

- Charles A. Toebe, 149 North Third Street, Philadelphia, Pennsylvania.
Fellowcrafters, 2 Perkins Square, Jamaica Plain Station, Boston, Massachusetts.
Graton and Knight, Worcester, Massachusetts.
Handicraft Leather and Supply House, Rochester, New York.
Lester Griswold, Colorado Springs, Colorado.
National Craft Supply Company, The, 94 Lexington Avenue, New York City.
United Clay Mines Corporation, Trenton, New Jersey.
W. A. Hall, 250 Devonshire Street, Boston, Massachusetts.
Waldcraft Company, The, Indianapolis, Indiana.
William Dixon, Inc., Newark, New Jersey.
Magnus Brush and Craft Materials, 604 West Lake Street, Chicago, Illinois.
Milton Bradley Company, 401 North Broad Street, Philadelphia, Pennsylvania.

Hooked Rugs (Frames, Designs, Tools, and Materials)

- Art Crafts Industries, 66 Church Street, Cambridge, Massachusetts.
Crafts Supply Company, The, 207 West 16th Street, New York City.
D. W. and W. Hosiery Company, 1130 Moss Street, Reading, Pennsylvania. (Looper Clips and Roundings.)
Emile Bernat and Sons Company, 89-99 Bickford Street, Jamaica Plains, Massachusetts.

Weaving, Crocheting, Knitting, Sewing, and Embroidery Materials

- American Weaving Company, Syracuse, New York.
Art Craft Industries, 66 Church Street, Cambridge, Massachusetts.
Emile Bernat and Sons Company, 89-99 Bickford Street, Jamaica Plains, Massachusetts.
January and Wood Company, Maysville, Kentucky.
Ludlow Manufacturing Associates, Boston, Massachusetts.
Reed Manufacturing Company, Springfield, Ohio.
Structo Manufacturing Company, Freeport, Illinois.
Tinkler and Company, 527 Arch Street, Philadelphia, Pennsylvania.

Looms

Art craft looms, 4-harness :

- Art Craft Industries, Cambridge, Massachusetts.
Structo Manufacturing Company, Freeport, Illinois.

Looms—Continued

Cambridge 4-harness looms :

Garden City Educational Company, Chicago, Illinois.

Hammett's 4-harness loom :

J. L. Hammett Company, Newark, New Jersey.

Ideal loom :

Art Craft Industries, 66 Church Street, Cambridge, Massachusetts.

C. A. Reed Company, Springfield, Ohio.

Garden City Educational Company, Chicago, Illinois.

J. L. Hammett Company, Newark, New Jersey.

Milton Bradley Company, Philadelphia, Pennsylvania.

Little dandy loom :

From firms selling the Ideal loom.

Linoleum Carving, Wood Carving, and Block Printing (Tools, Materials, and Designs)

Fellowcrafters, 2 Perkins Square, Jamaica Plain Station, Boston, Massachusetts.

Hunt Pen Company, Camden, New Jersey.

J. L. Hammett Company, Newark, New Jersey.

Milton Bradley Company, 401 North Broad Street, Philadelphia, Pennsylvania.

National Crafts Supply Company, The, 94 Lexington Avenue, New York City.

O. P. Craft Company, Inc., The, Sandusky, Ohio.

Polar Manufacturing Company, 401 North Broad Street, Philadelphia, Pennsylvania. (Linoleum scrap.)

Waldcraft Company, The, Indianapolis, Indiana.

F. Weber and Company, Philadelphia, Pennsylvania.

Marionettes

Fellowcrafters, 2 Perkins Square, Jamaica Plain Station, Boston, Massachusetts.

Waldcraft Company, The, Indianapolis, Indiana.

Metal Crafts

Fellowcrafters, 2 Perkins Square, Jamaica Plain Station, Boston, Massachusetts.

Junior Achievement, Inc., Springfield, Massachusetts.

Lester Griswold, Colorado Springs, Colorado.

Metal Crafts—Continued

- Metal Crafts Supply Company, Providence, Rhode Island.
National Crafts Supply Company, The, 94 Lexington Avenue, New York City.
T. B. Hagstoz and Son, 709 Sansom Street, Philadelphia, Pennsylvania. (Sterling silver.)
William Dixon, Inc., Newark, New Jersey.
Hammacher, Schlemmar and Company, Athol, Massachusetts. (Vises.)

Woodworking Tools and Materials

- Fellowcrafters, 2 Perkins Square, Jamaica Plain Station, Boston, Massachusetts.
Hammacher, Schlemmar and Company, Fourth Avenue and 13th Street, New York City.
Henry Disston and Sons, Philadelphia, Pennsylvania.
Junior Achievement, Inc., Springfield, Massachusetts.
Miller Falls Company, Miller Falls, Massachusetts.
Stanley Rule and Level Company, New Britain, Connecticut.

Supply Houses—General

- American Crayon Company, Sandusky, Ohio. (O. P. Craft materials.)
American Handicrafts Company, 193 William Street, New York City.
Binney and Smith Company, New York City.
Favor, Ruhl and Company, 425 South Wabash Avenue, Chicago, Illinois. (German batik dyes.)
Fellowcrafters, Inc., 64 Stanhope Street, Boston, Massachusetts.
Industrial Arts Cooperative Service, 519 West 121st Street, New York City.
J. L. Hammett and Company, 380 Jelliff Avenue, Newark, New Jersey. (Weaving and basketry.)
Lester Griswold, Colorado Springs, Colorado.
Milton Bradley Company, Philadelphia, Pennsylvania.
National Craft Supply Company, 94 Lexington Avenue, New York City.
Universal School of Handicrafts, Inc., Rockefeller Center, 2515 RKO Building, New York City.
Weber and Company, Chestnut Street, Philadelphia, Pennsylvania. (Block printing supplies.)

3. LIST OF SUGGESTED WASTE MATERIALS

These materials for art and handwork may be obtained from the home and other sources :

Clay for modeling and pottery work, from local sources.
 Various cardboard boxes—cereal and others—for redecorating and construction.
 Cigar boxes and others for construction and redecorating.
 Tin boxes and cans for trays and other metal craft.
 Jars and bottles for redecorating.
 Linoleum scraps from shops and home for block printing.
 Burlap sacks for Indian costumes and other purposes.
 Sugar and flour bags for decorated hangings.
 Inner rubber tubes for block printing, sandals, etc.
 Corks, sticks, felt scraps, for stick printing.
 Peas, beans, lentils, and noodles for necklaces.
 Cretonne samples and others for various purposes.
 Corn husks for weaving and shelter projects.
 Corn cobs for puppets.
 Cattail rushes for weaving.
 Backs of pads for booklets.
 Spools for toys; clothespins for dolls.
 Discarded magazines for clipping and references.
 Wrapping paper, wall paper samples and remnants.
 Celophane, tin foil, paper towels, and envelope linings for various purposes.
 Paste may be made from flour.
 Calcimine paint for color work.
 Paper plates for decorating.
 Soap for carving.
 Silk stockings for weaving.

Paste Recipe

3 cups cold water.
 3 cups of flour.
 3 cups of boiling water.
 1 teaspoon of salicylic acid.
 1 tablespoon of alum.
 1 tablespoon of carbolic acid.
 A few drops of wintergreen.

Mix flour, salicylic acid, and alum, and add cold water. Pour this into boiling water in a double boiler. Cook until clear. Add boiling water until it is the consistency of thick cream. Add carbolic acid and wintergreen, pour into jars. This should fill three quart jars. When cool, close jars.

IV. SCHOOL PROVISIONS FOR INDUSTRIAL ARTS TEACHING AND LEARNING

A. TIME ALLOTMENT

The time devoted to industrial arts cannot be definitely set or limited. If the curriculum is organized even in part on an activity basis, a definite amount of time cannot be set aside for industrial arts since it will be an inherent part of the total situation in which the need naturally arises in the course of the activity. As industrial arts as a study takes its place among the important social studies, and its broadened objectives are met, an increase (rather than a decrease) in customary time allotments will be required.

An estimate might be stated at 150 minutes per week—thirty minutes per day—with about one-half of this time devoted to manipulation.

B. THE TEACHER

In order that relationships may have their proper emphasis, the teacher of industrial arts should be the regular teacher. If a special teacher is employed, industrial arts will advance providing the same relationships are established and developed. The teacher should enter wholeheartedly into an industrial arts program that provides the tools and procedures for purposeful activities and integration.

Teachers should be as well prepared to teach industrial arts as they are to teach other subjects. All art courses in our state teachers colleges include instruction in elementary industrial arts and summer sessions offer opportunities for the teacher in service to take on new ideas and new experiences.

C. FUNCTION OF THE ART SUPERVISOR

It is assumed that the art supervisor knows elementary education as well as art, and believes in working the two together. The art supervisor should be ready at all times to assist the classroom teacher wherever possible, or act in an advisory capacity. In any case, the art supervisor and the classroom teacher should work together cooperatively and harmoniously.

Where the teachers lack experiences in the work of industrial arts, a well-prepared supervisor is needed. Her aim will be to develop self-dependence on the part of teachers as soon as possible.

D. EQUIPMENT

1. FOR GRADE ROOMS

Each grade room should have an adequate supply of a variety of raw materials used in construction activities including generous amounts of clay, wood, materials for weaving, paints, paper, etc. Tools for working with these materials such as scissors, paste, drawing tools, utensils, and a means for preparing foods, should also be present. It should be

equipped with one work bench adjusted to the average height of the pupils of the room. It should have the necessary tools accompanying a work bench, including a vise. Each room should have a table or shelves for displaying work completed or in the process of development. Oilcloth to cover tables will make clay work possible. A supply and storage cabinet for materials should be provided and running water in the room is also desirable.

2. FOR THE INDUSTRIAL ARTS ROOM

The need and equipment for a special industrial arts room has been discussed in part on pages 47 and 49.

In such a room equipment and materials can be assembled for the use of a large number of pupils. Economies can thus be effected with respect to more costly articles which need not or cannot be supplied for each classroom. A unit-and-a-half classroom (23 feet by 45 feet) will provide sufficient space for carrying on activities and offers advantages over the unfavorable conditions that exist in the formal and frequently crowded classroom.

In addition to the equipment already mentioned, the room should have a stove with an oven, one or two sewing machines, a small printing press with type, a blackboard, a bulletin board, and exhibit stands.

Below is a minimum list¹ of tools for the work in wood, metals, and other materials. It represents an adequate supply for thirty pupils working at one time.

15 double benches, adjustable for height; iron screw vises.

30 ten-inch hacksaws.

6 cross-cut saws, twenty inches, ten points to the inch.

6 rip-saws, twenty inches, eight points to the inch.

3 keyhole saws.

1 iron miter box.

30 hammers, eight ounces, flat face.

5 bit braces, six-inch sweep.

3 sets short auger bits, one-quarter inch, five-eighths inch.

2 sets long auger bits, one-quarter inch, one inch.

1 coping saw.

10 screw drivers, different sizes.

30 try squares, six inches.

1 steel square.

2 marking gauges.

6 bench hooks.

6 clamps, iron, "C."

¹ Bonser, F. B. *Industrial Arts for Public School Administrators*. Op. cit. pp. 28, 29.

- 5 short chisels, one each, three-sixteenths inch, one-quarter inch, one-half inch, three-quarters inch, one inch.
- 30 rulers.
- 30 pencil compasses.
- 6 gauges, one each, one-quarter inch, three-eighths inch; two each, one-half inch, three-quarters inch.
- 4 mallets, three-and-one-half-inch face.
- 1 countersink.
- 15 block planes.
- 8 jack planes.
- 5 spoke shaves.
- 1 level.
- 1 round file; one half-round file; two flat files.
- 1 file brush.
- 1 pair tongs.
- 1 pair pliers, side cutting.
- 1 ladle for lead.
- 2 tinner's snips.
- 1 roller cutter.
- 1 large iron vise; one small iron vise.
- 1 kiln for firing pottery.
- dishes, pans, kettles, and spoons.

Some of the equipment which has been suggested may be made by the pupils.

E. HOBBY CLUBS

The values of industrial arts as a study for recreational purposes have been mentioned. It has also been pointed out that engaging in the handicrafts has an unusual appeal for most children. For some it might become a real hobby if encouragement and provision is made for further work.

It is suggested that one hour a week be set aside as a hobby hour. During this time all those children who have a common interest may meet and work together. Those interested in handicrafts might spend this time in the industrial arts room while others interested in games, science, story telling, dancing, etc., might meet elsewhere. Each group may be in charge of one of the regular classroom teachers who also has the same interest. During this time children are given much freedom to choose what they will do and to explore in the doing of it. It is essential that they and the teacher enjoy what they are doing. The only requirements are that they be economical of time and materials and that they accomplish what they set out to do.

Hobby clubs in the elementary school, especially in grades IV, V and VI, are becoming increasingly popular.

F. EXCURSIONS

Excursions to places of interest play a large part in an industrial arts program. Learning can become much more authentic if children have the opportunity to see and to work with real materials. Suggestions for excursions, how to provide for them, and how to guide them so that they will be truly educational are discussed in another of the Department of Public Instruction bulletins.²

G. READING MATERIALS

In the selection of books for the school library, both for work and for recreational reading, adequate provision should be made for materials which feed into the purposes of industrial arts as a study. Such provision will enrich greatly the study of industrial arts.

² *Expanding the Classroom*. Department of Public Instruction. Harrisburg, Pennsylvania. 1938.

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